

Malayan
Agricultural
Implements



Malayan Agricultural Implements



Presented by the Shell Company of the Federation of Malaya.

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Introduction

In this small book we have attempted to illustrate some of the agricultural implements at present in use in the Federation of Malaya. The majority of these are used in the cultivation of rice which is the main food of our multi-racial population. In many parts of the cultivated areas of the Federation the traditional implements are giving way to more mechanised forms of farming.

To obtain maximum yields agriculture needs many types of insecticides and weedkillers to protect its crops. It needs other chemicals to help their growth. It needs fuels and oils to run the machines. The Shell Company of the Federation of Malaya provides all these, together with advice and help to estates, farms and kampongs spread throughout the country.

We have received the greatest degree of help from the Department of Agriculture, Penghulus and farmers, and we have been very fortunate in obtaining the services of Mohammed Hoessein, one of Malaya's most distinguished artists, to illustrate this book and to give life to our pages.

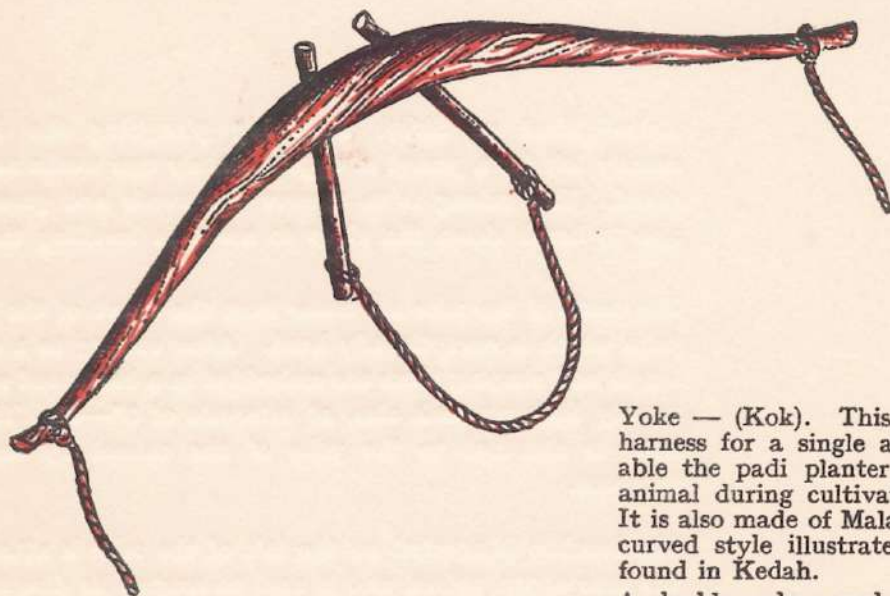
Acknowledgements

The Shell Company of the Federation of Malaya wish to thank the Officers of the Department of Agriculture, Federation of Malaya, for their assistance in the preparation of this book.

Plough

Plough — (Bajak or Tenggola). The plough illustrated is typical of those found in the Northern padi areas of Malaya. This style of plough with the curved handle is of Siamese origin. In some padi areas the ploughs are built with straight handles, this style being of Chinese origin.

The plough body is usually made of the Malayan teak (*Vitex pubescens*) known in Malay as the Leban or Halban. The plough shoe is of iron shaped by the local blacksmith. Using this style of plough, in a good working day the padi planter can plough up to one acre of sawah.

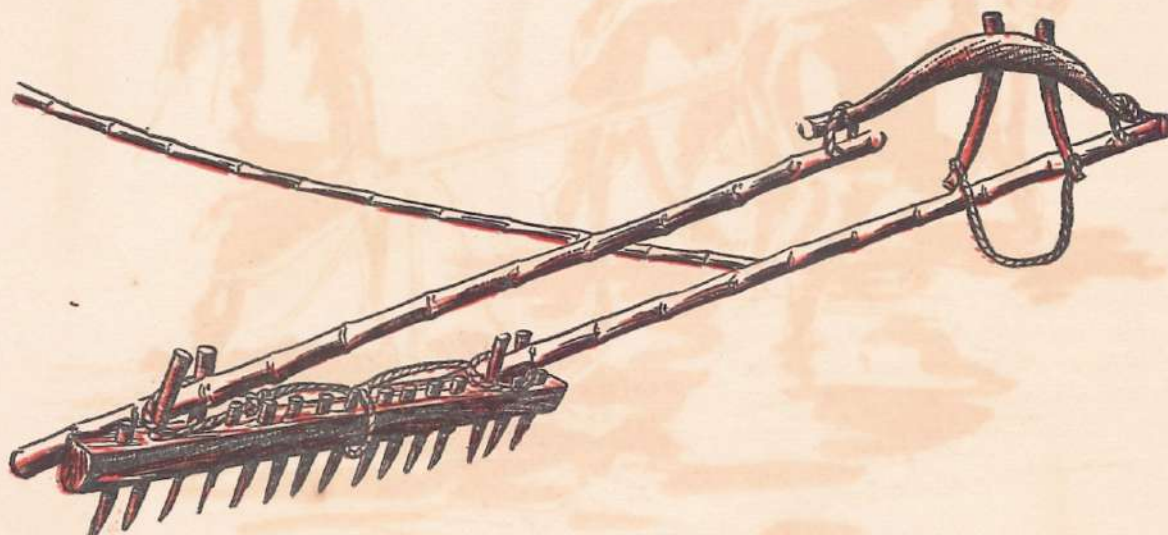


Yoke

Yoke — (Kok). This simple form of harness for a single animal is to enable the padi planter to control the animal during cultivation operations. It is also made of Malayan teak. The curved style illustrated is commonly found in Kedah.

A double yoke, used when two animals are working side by side is known in Malay as an igu.

Rake

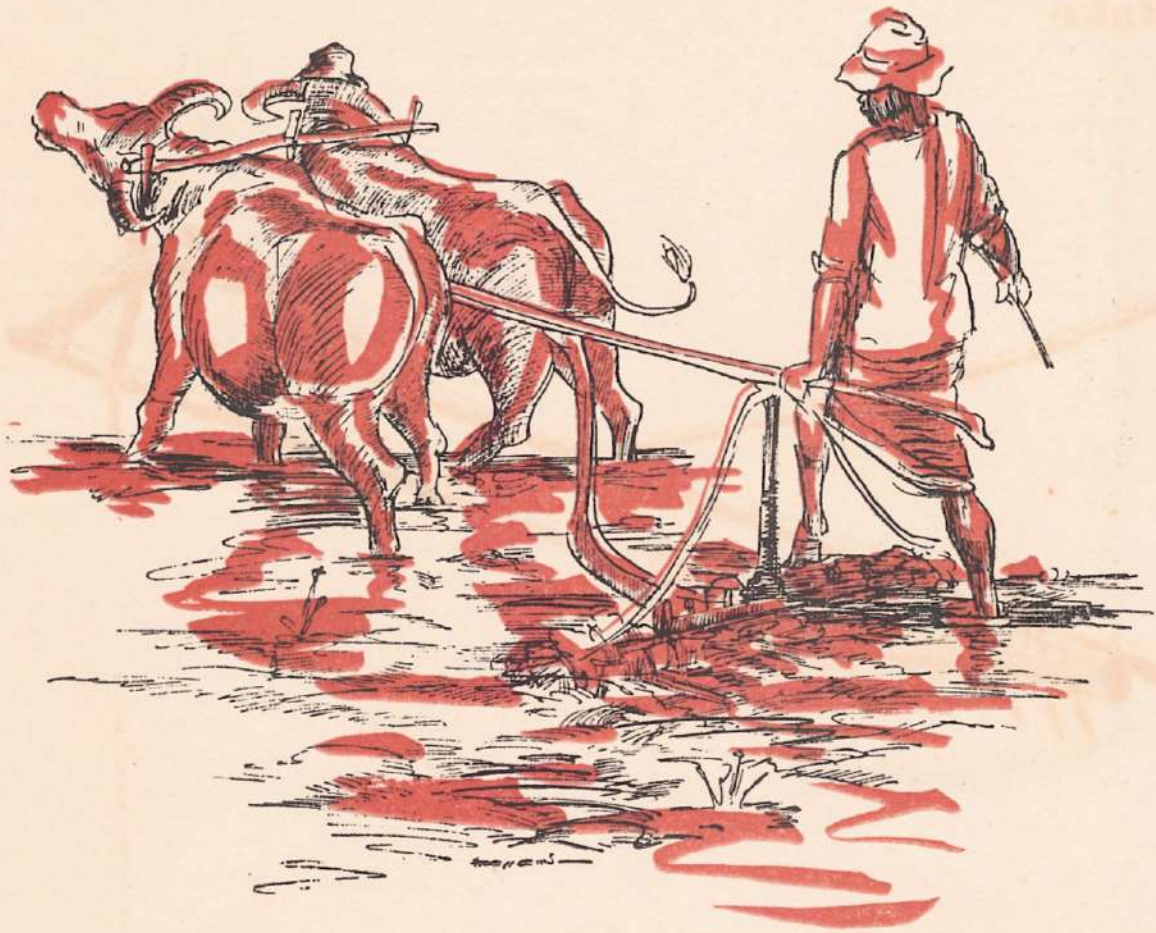


Rake—(Sikat or Sisir). Following ploughing the land is usually left for a period of approximately two weeks and then raked. This raking is to remove the weeds and grasses and also to break down the clods to assist in levelling the land.

The teeth of the rake are made from the trunk of the Nibong palm which is exceptionally hard. After cutting to a suitable length and shaping these are embedded in a hardwood support, usually Malayan teak also, at intervals of 3"—4". The rake body is attached to the yoke of the animal by means of bamboos.

The bamboo illustrated on the left of the rake is attached to the nose of the animal and is used to control its direction etc.

The rope attached to the rake is used to lift it over the accumulated weeds and grasses whenever necessary.



Ploughing the sawah—a typical East Coast scene.

Weed Cutter



Weed cutter — (Tajak panjang). This is used to prepare the land before transplanting the padi seedlings usually in areas which have not been ploughed. Land preparation using this method is most common in the Krian area of Perak and in Tanjong Karang in Selangor. After water has been on the land for at least one week the soil is considered sufficiently soft by the padi planter to cultivate. All weed and grass growth is slashed, following this it is left for two or three weeks; then raked and left in heaps. It is then turned in the heaps until rotted and the residue is placed on the banks and used for water control. The land is usually cultivated twice by this method prior to transplanting.

Rake

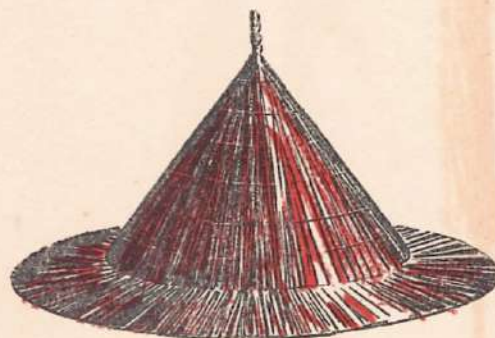
Rake—(Sisir). This rake is used in heaping up the grass and weeds slashed by the grass cutter described above. It consists of a handle and a crosspiece into which are placed the teeth. The teeth are of hard wood, usually of the nibong palm or mangrove (bakau).



Hats



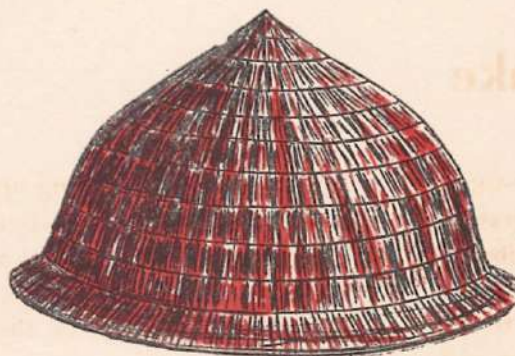
Hats—(Terendak). Hats form an essential part of the attire of the Malayan padi planter as he is exposed to the sun during most of the day with no overhead shade. This is of the Negri Sembilan-Malacca style.



The hats themselves are made of mengkuang leaves sewn together using cotton. The rim of the hat is often of fine bamboo. A more ornate variation of the Negri Sembilan-Malacca style.



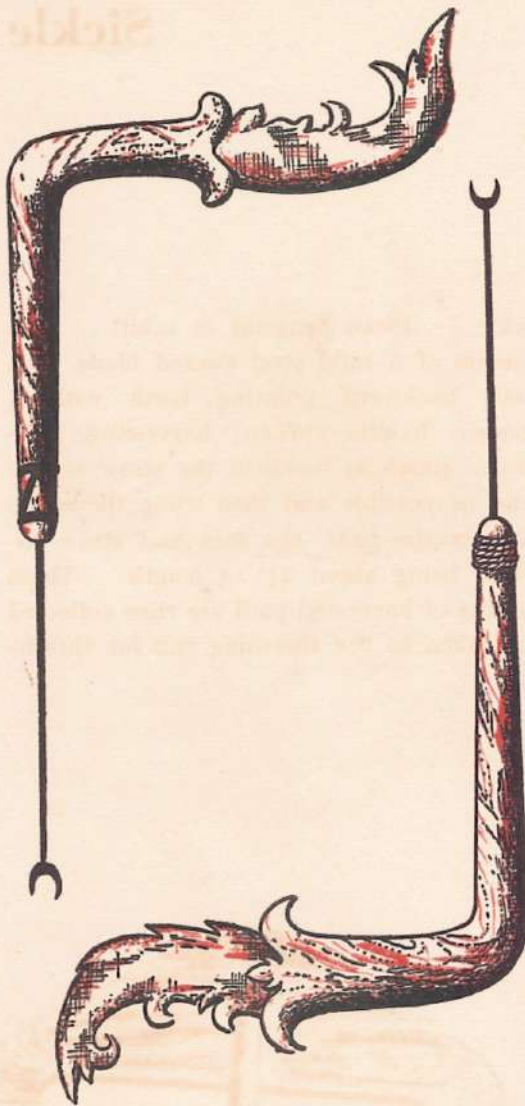
This is the style of the Krian, Parit Buntar areas of Perak.



East Coast style.

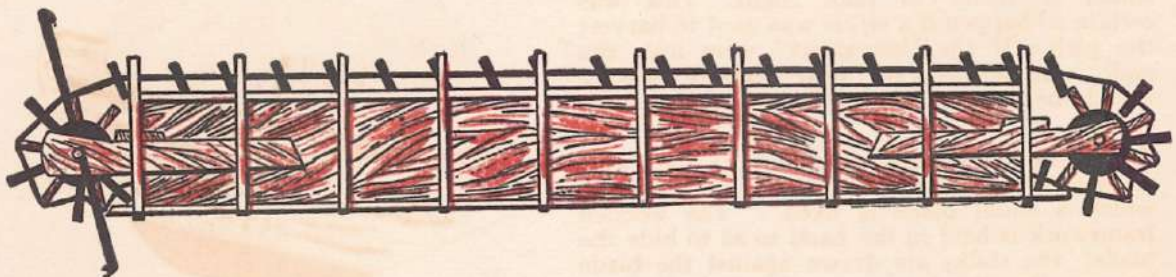
Padi Transplanter

Padi Transplanter — (Kuku Kambing). In Malay the literal translation is goat's hoof so called because of the shape of the iron portion. It is more commonly used in the Northern padi areas of Malaya, particularly in areas which have not been ploughed and where the ground is too hard to transplant the padi seedlings by hand. Two or three padi seedlings are placed in the fork and the roots then pushed approximately one inch into the earth.

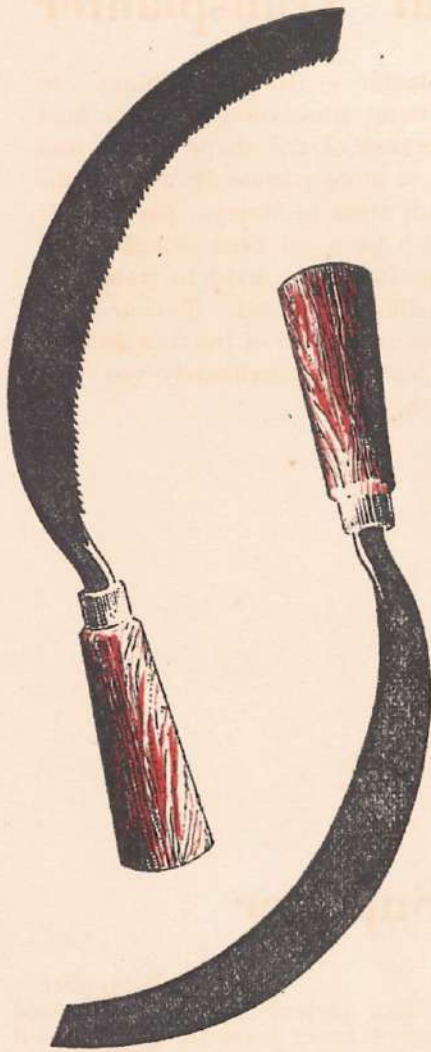


Water Supplier

Water supplier— (Kinchir ayer). This ancient implement was used to lift water from a lower level to irrigate padi sawahs which are on a higher level. It consists of a wooden flume at the base of which is a small wheel with paddles. This can be rotated manually or by the flow of the river. As it rotates it operates further paddles within the flume which lift the water to the level desired. From there it is led by means of canals into the sawahs. At the present stage of development in Malaya, improvements to irrigation facilities have rendered this method of water supply obsolete.



Sickle

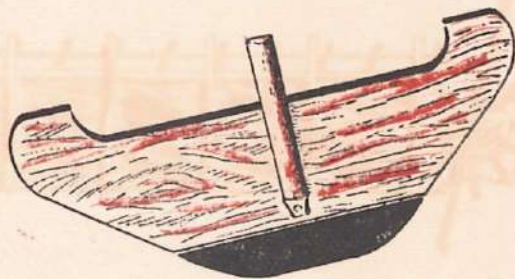
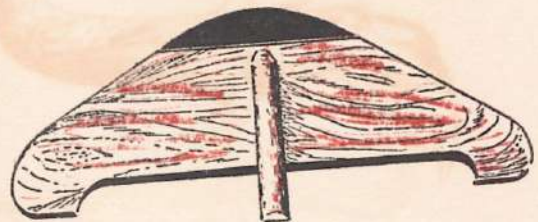


Sickle — (Pisau pengerat or sabit). This consists of a mild steel curved blade with small backward pointing teeth with a wooden handle. When harvesting, the farmer grasps as much of the straw in one hand as possible and then using the sickle harvests the padi, the ears and straw together being about $2\frac{1}{2}$ ' in length. These bundles of harvested padi are then collected and taken to the threshing tub for threshing.

Reaping Knife

Reaping knife—(Tuai). One of the ancient beliefs among the padi planters which with the modern generation is rapidly dying out, is that the padi grains have a vitality (semangat) which is likely to take fright. This was certain to happen if a sickle was used to harvest the padi. If the "semangat" were lost, the padi seed selected for next seasons' sowing would be of no use and crop failure was certain.

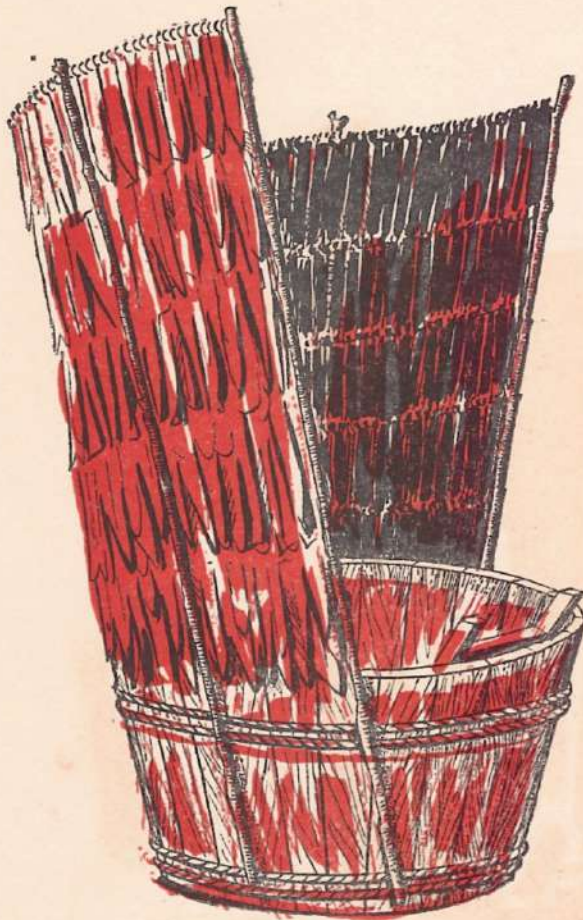
This knife consists of a framework of wood, often crescentic in shape, in the outer centre of which a small blade is fixed. The wooden framework is held in the hand so as to hide the blade; the stalks are drawn against the blade between the fingers.





Harvest in progress — working the threshing tub.

Threshing Tub



Threshing tub — (Tong banting). This consists of a wooden tub made from planking bound with rotan. These are of sufficient size to hold approximately one sack of padi. They are light in order to facilitate transportation within the sawah as harvest progresses. Inside the tub is a small ladder, the rungs of which are usually made of nibong or bamboo and spaced at 4". The ripened padi is threshed by beating the ears against the rungs of this ladder, the threshed grains falling through the rungs.

Hand Mortar

Hand mortar — (Lesong tangan). This style of hand milling is common throughout Malaya. The size and shape of the mortar depends on the availability of wood in the vicinity. It is made from the trunk of a hardwood species tree. This is usually the Malayan teak (Halban), Malacca teak (Merbau) or Jack fruit tree (Nangka). A common size of hole is 1' in diameter and 8" deep, the whole mortar standing some 18" high. The wooden pounder (Antam) is of hardwood also.

Sufficient padi is milled to meet the families' requirements for a few days at a time.

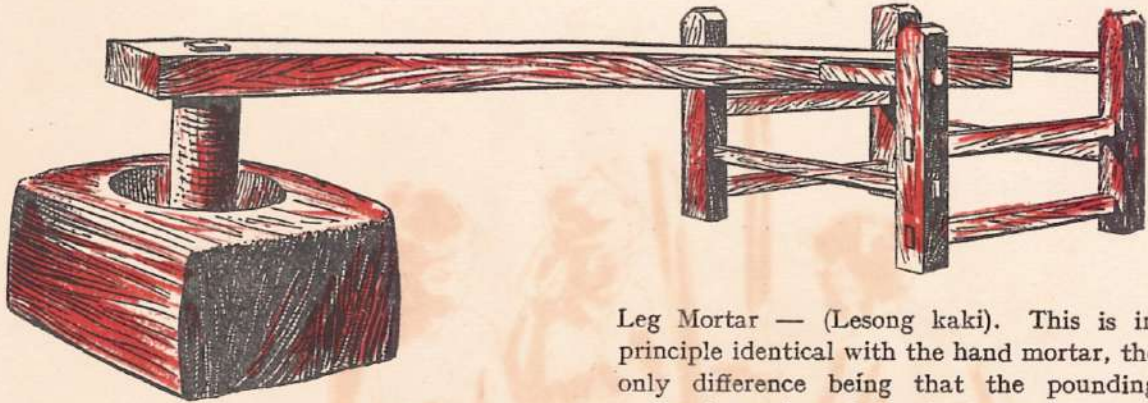
This work is usually carried out by the women-folk of the household.





Milling the padi.

Leg Mortar



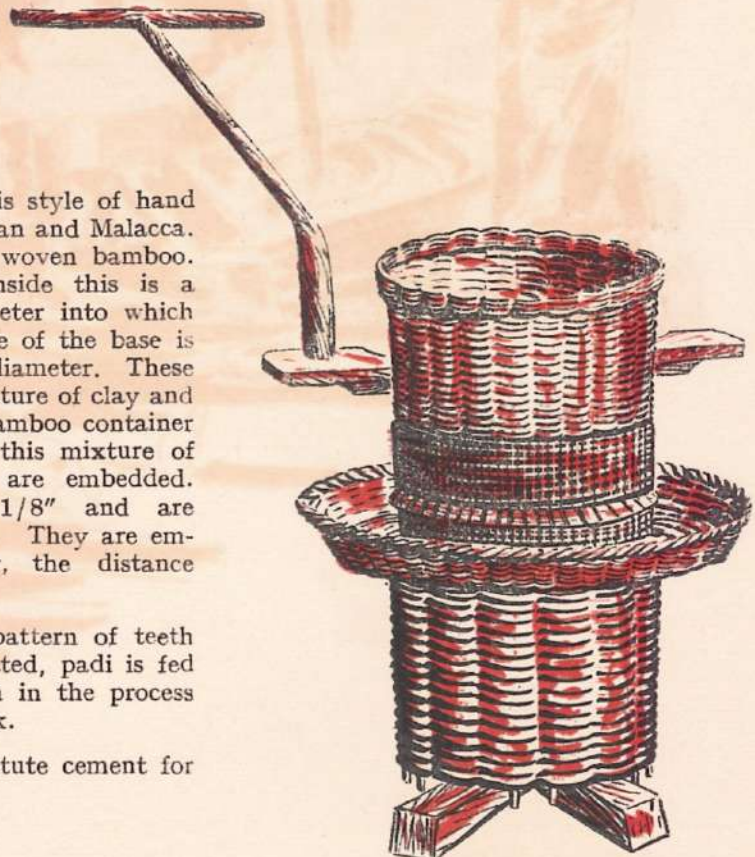
Leg Mortar — (Lesong kaki). This is in principle identical with the hand mortar, the only difference being that the pounding action is motivated by the leg rather than the hand.

Padi Mill

Padi Mill — (Kisaran padi). This style of hand mill is found only in Negri Sembilan and Malacca. The outer framework consists of woven bamboo. The top half is detachable. Inside this is a central hole usually 18" in diameter into which the padi is placed. At the centre of the base is a smaller hole, usually 3" in diameter. These apertures are made by using a mixture of clay and salt and shaping this inside the bamboo container to the desired dimensions. In this mixture of clay and salt, hardwood teeth are embedded. They protrude approximately $\frac{1}{8}$ " and are approximately $2" \times \frac{1}{4}"$ in section. They are embedded in a concentric manner, the distance between the teeth being $\frac{1}{4}"$.

The bottom half has a similar pattern of teeth embedded, and as the top is rotated, padi is fed onto the two sets of teeth which in the process of rotation remove the padi husk.

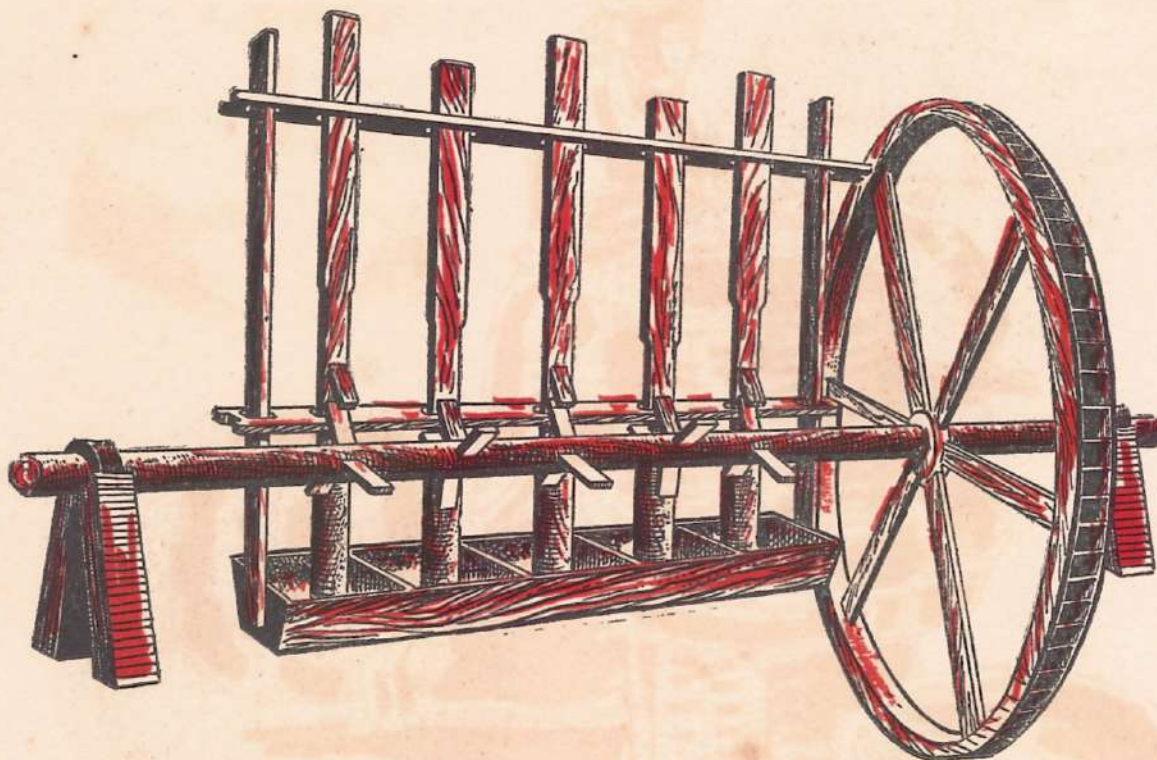
A modern innovation is to substitute cement for the clay and salt mixture.





A further study of padi milling commonly seen in Negri Sembilan and Malacca.

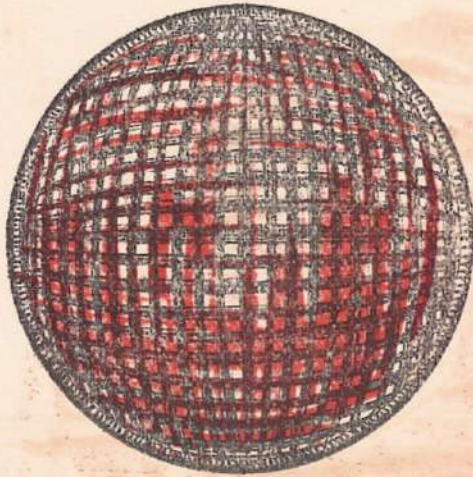
Water Mill



Water mill — (Kinchir padi). This style of mill is now virtually lost to posterity as only one is known to exist in Lenggeng, Negri Sembilan. The origin of the design of this mill is from Sumatra and presumably was reproduced in the padi areas of Negri Sembilan by the original Minangkabau settlers who came from Sumatra.

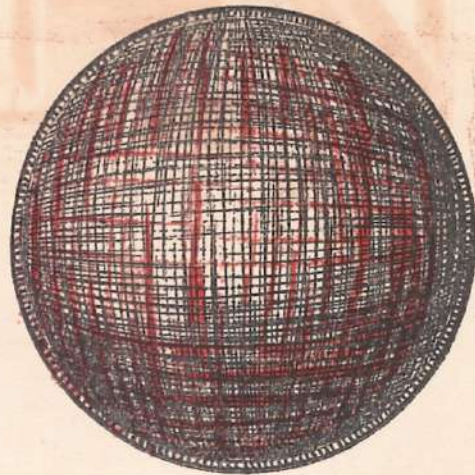
Water from a stream revolves the wheel, which turns a shaft to which are attached wooden blades fixed at different angles at regular intervals. As they rotate, the blades hit the corresponding blades attached to wooden pounders moving them up and down to pound the padi.

Winnowing Tray

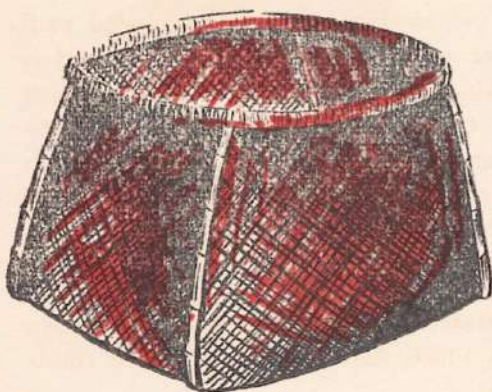


Winnowing tray—(Badang). This is used to toss the grain in the air following pounding to get rid of the dust and chaff.

It is constructed of split bamboo and rotan. The finer weave style is of bertam and rotan.

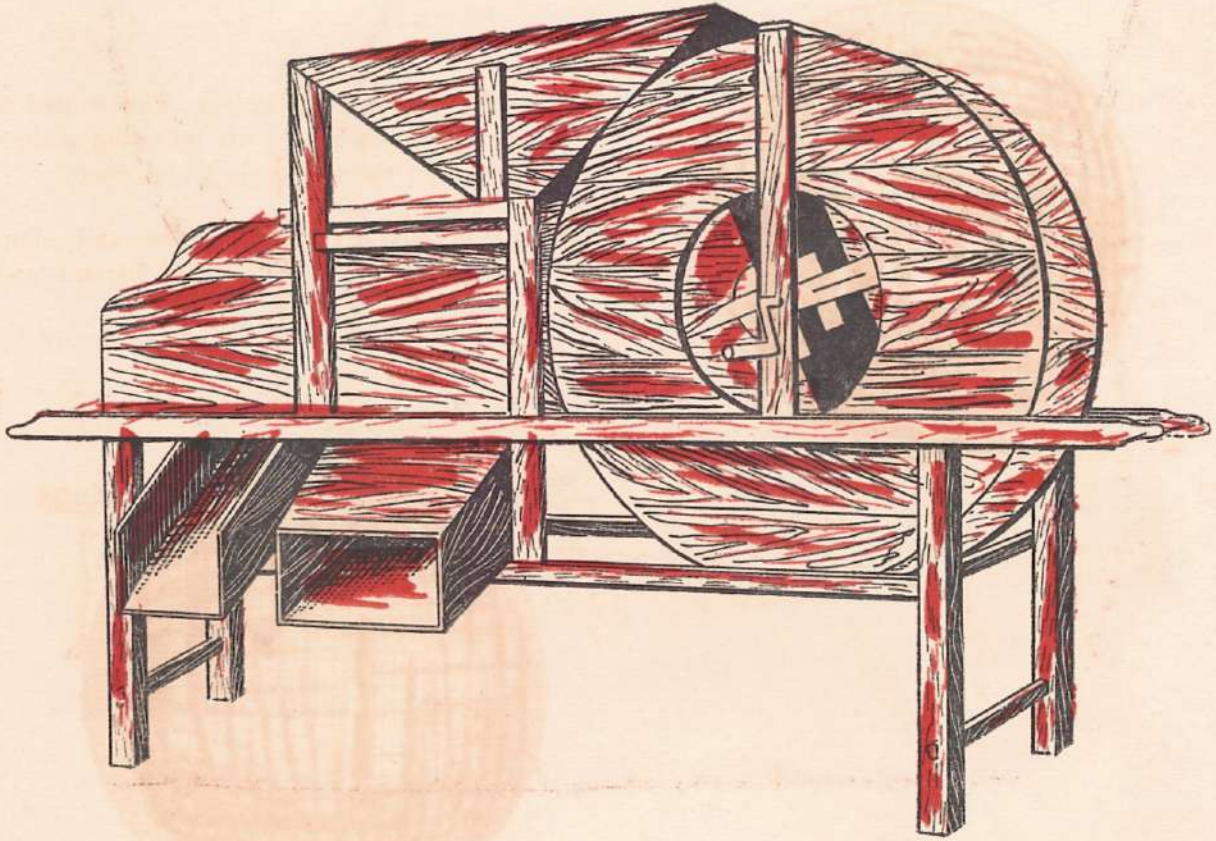


Basket



Basket — (Bakul). General style of basket for carrying padi or rice made from whatever materials are readily available. The more common materials used are bamboo, rotan and bemban.

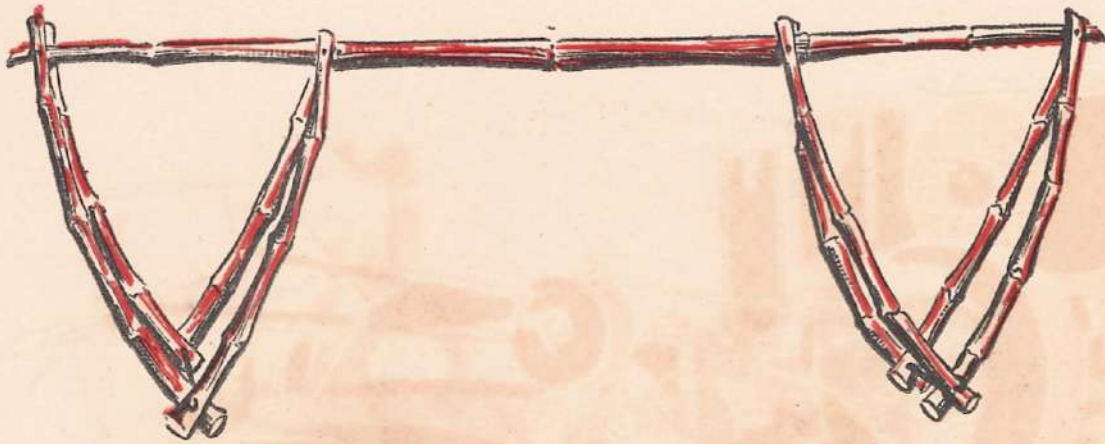
Winnower



Winnower — (Penampi padi). The winnowing machine is initially used to clean the padi from the broken straw, trash, dust etc. after threshing. Then it is used to separate the rice from the husk following pounding. It is an improvement on the winnowing tray. The pounded padi is placed in the container at the top of the winnower and is allowed gradually to trickle out at the base. As it is falling it is subjected to an air current. This air current blows the lighter husk farther than the heavier rice, thus enabling a simple separation to be carried out, the rice falling down the central shute nearest the container, and the husk falling down the second shute.

The air current is generated by turning the handle shown in the illustration above which then causes paddles to rotate inside the circular drum.

Fodder Carrier



Fodder carrier — (Kandaran). This fodder carrier is used by the farmers to carry cut fodder to their cattle. Padi planters in Kelantan, Trengganu, Kedah, Perlis, Penang and Malacca, where the majority of the padi land is ploughed by animals have of necessity, during the padi season, to stall-feed their animals. It is very simply constructed of cut bamboos. The fodder is cut from the batas within the padi fields, alongside access roads.

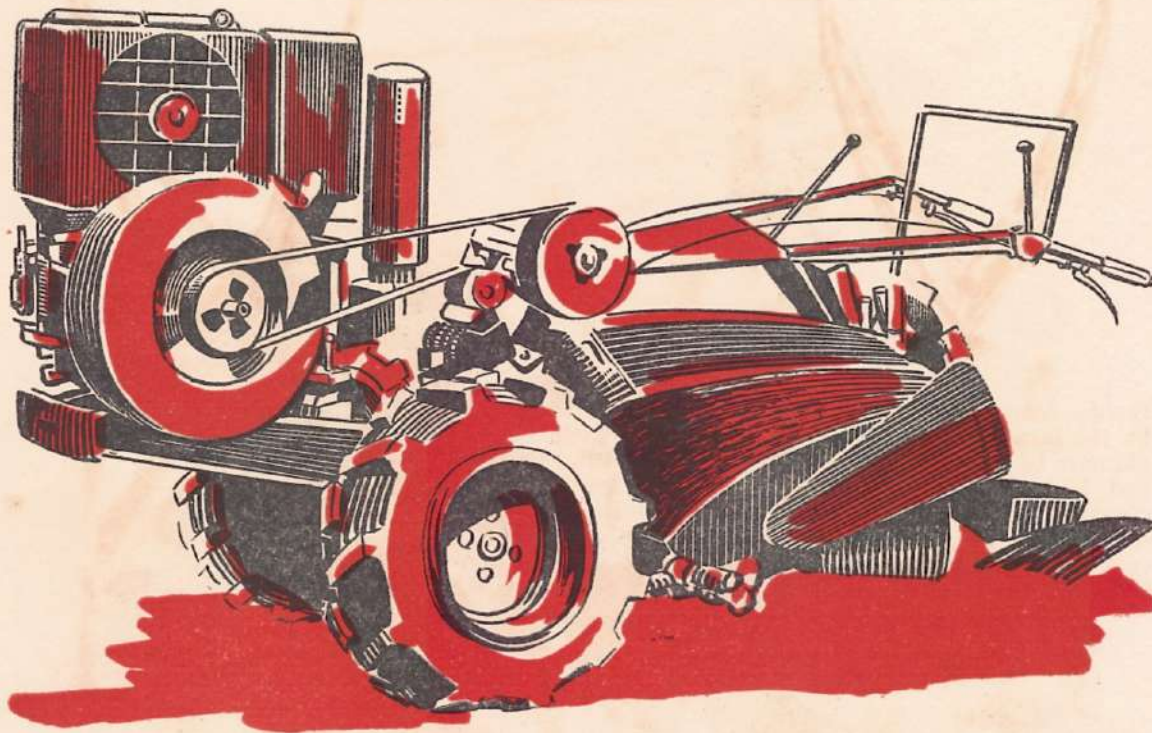
Padi Carrier



Padi carrier — (Raga dengan pangandar). This is used by the farmer to carry the threshed padi from the threshing tub in the field to his house for storage.

The baskets themselves are of woven bamboo and supported usually with rotan rather than by rope.

Pedestrian Operated Tractor



Pedestrian operated tractor — in recent years the use of the pedestrian operated tractor has increased considerably. These machines have proved most versatile and a wide range of models are available on today's market. They are usually from 3 H.P. to 8 H.P. and can be either petrol, kerosine or diesel driven. These machines can be operated either under wet or dry conditions. Usually if the conditions are wet the rubber tyred wheels are changed for steel floating wheels.

Most models offer a variety of attachments which often include small trailers, grass cutters, irrigation pumps etc.

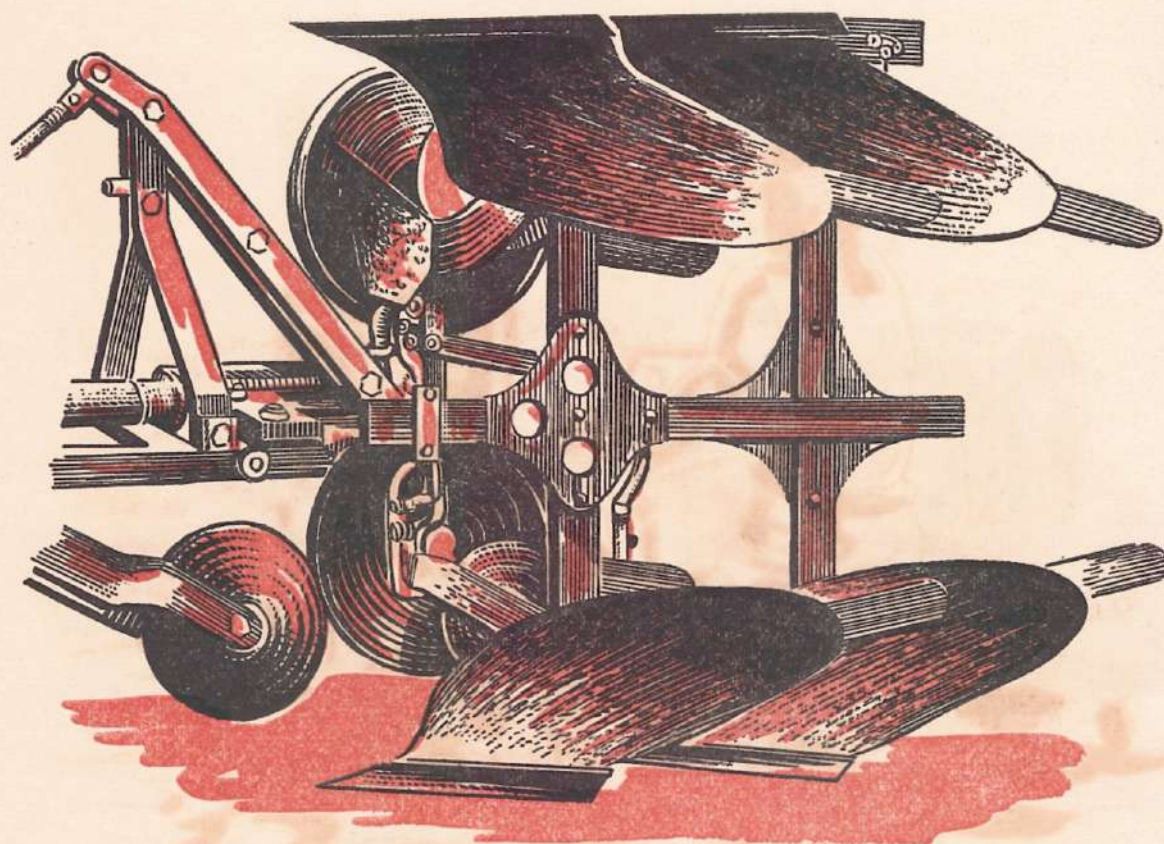
The machines, under good working conditions, can cultivate up to 2 acres per day.

One-Way Reversible Plough



Mechanisation in the rice field.

One-Way Reversible Plough



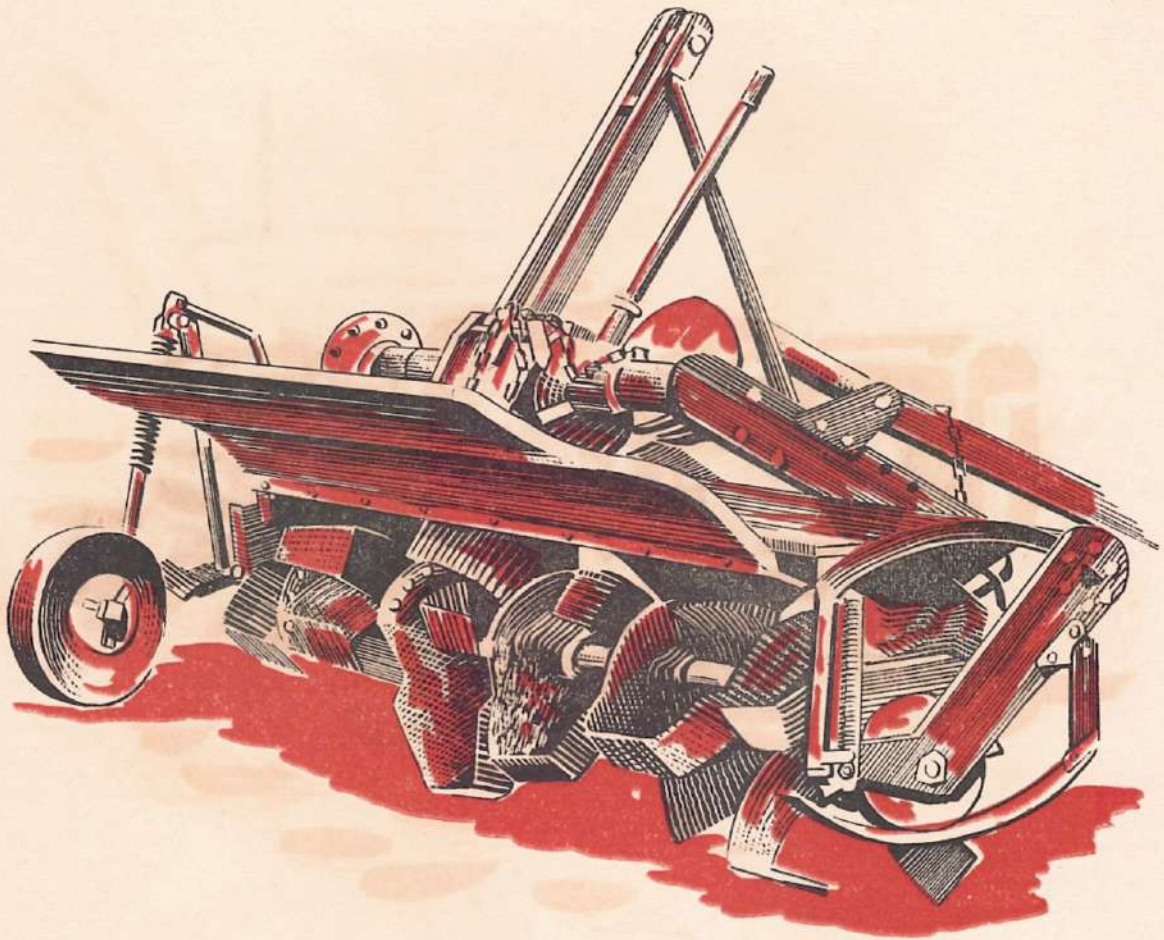
The one-way reversible plough is of value in the preparation of the padi land, as level conditions enable good water control to be effected. A one-way plough avoids rigs and furrows which are found following the more customary method of ploughing by disc or mould-board ploughs.

In good conditions a single furrow one-way reversible plough can plough approximately $\frac{3}{4}$ acre per hour, a double furrow one-way reversible plough $1\frac{1}{4}$ acres per hour.



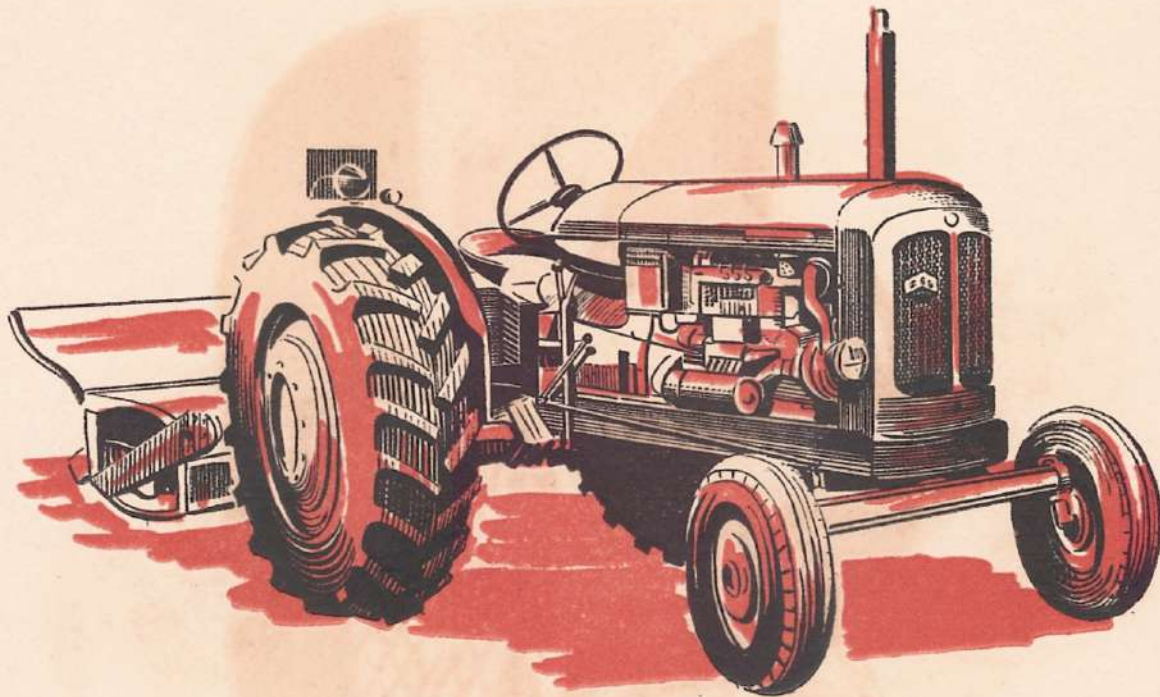
Ploughing of the sawah — modern style.

Rotavator



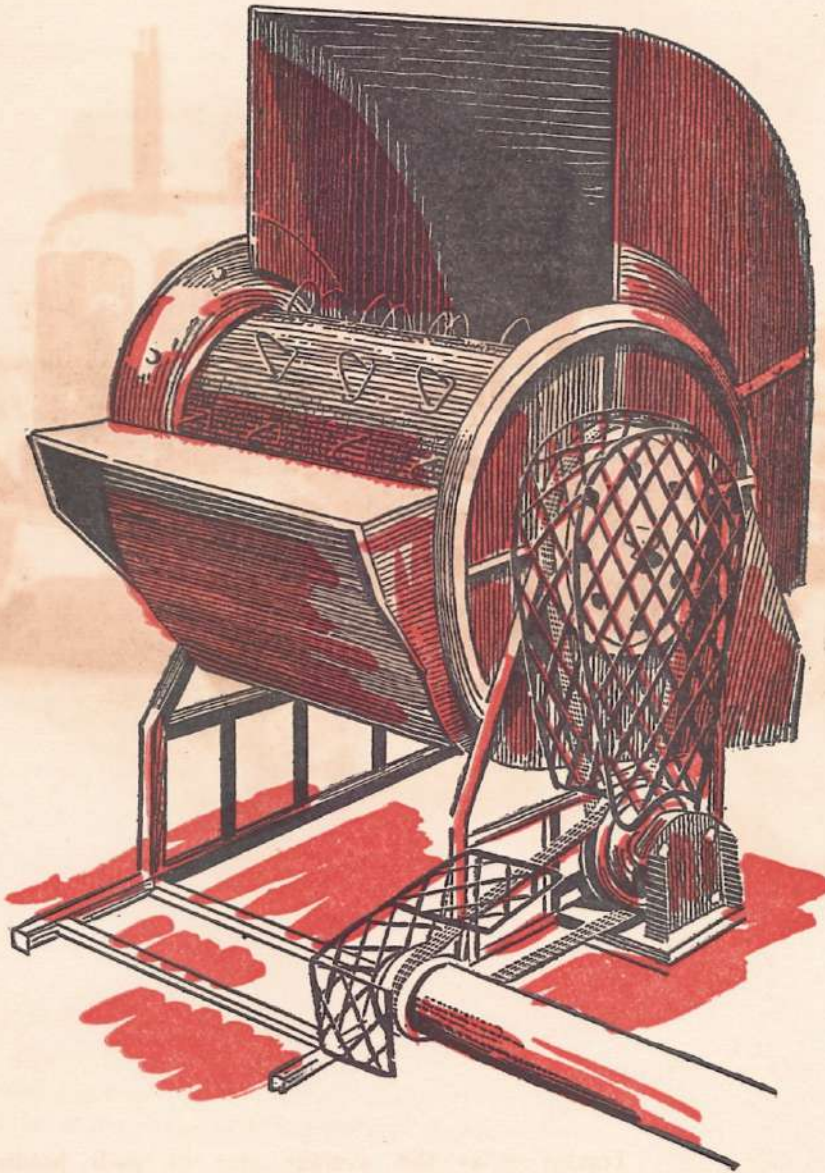
Rotavator — This implement is widely used in the cultivation of padi land. It is attached to the rear of the tractor and is coupled to the power take-off of the tractor. This in turn is coupled to a shaft along the length of which are attached blades. As the shaft rotates, the blades have a "changkolling" effect on the soil. The rate of revolution of the shaft depends on the engine speed. The depth of cultivation can be adjusted as desired from 1"—6". Under good conditions a 5' foot wide rotavator can cultivate some 3 acres per hour.

Tractor



Tractor — as the average size of padi holdings in the Federation of Malaya is comparatively small the economic use of large machinery by individuals is precluded. Of the total smallholding acreage in the Federation of Malaya some 30% is devoted to wet padi cultivation, and of the padi planters some 68% have holdings of less than 4 acres in extent. The larger tractors are usually hired by individuals from contractors to do the necessary cultivation for them. In other cases Co-operative Societies purchase machines and hire them out to their members.

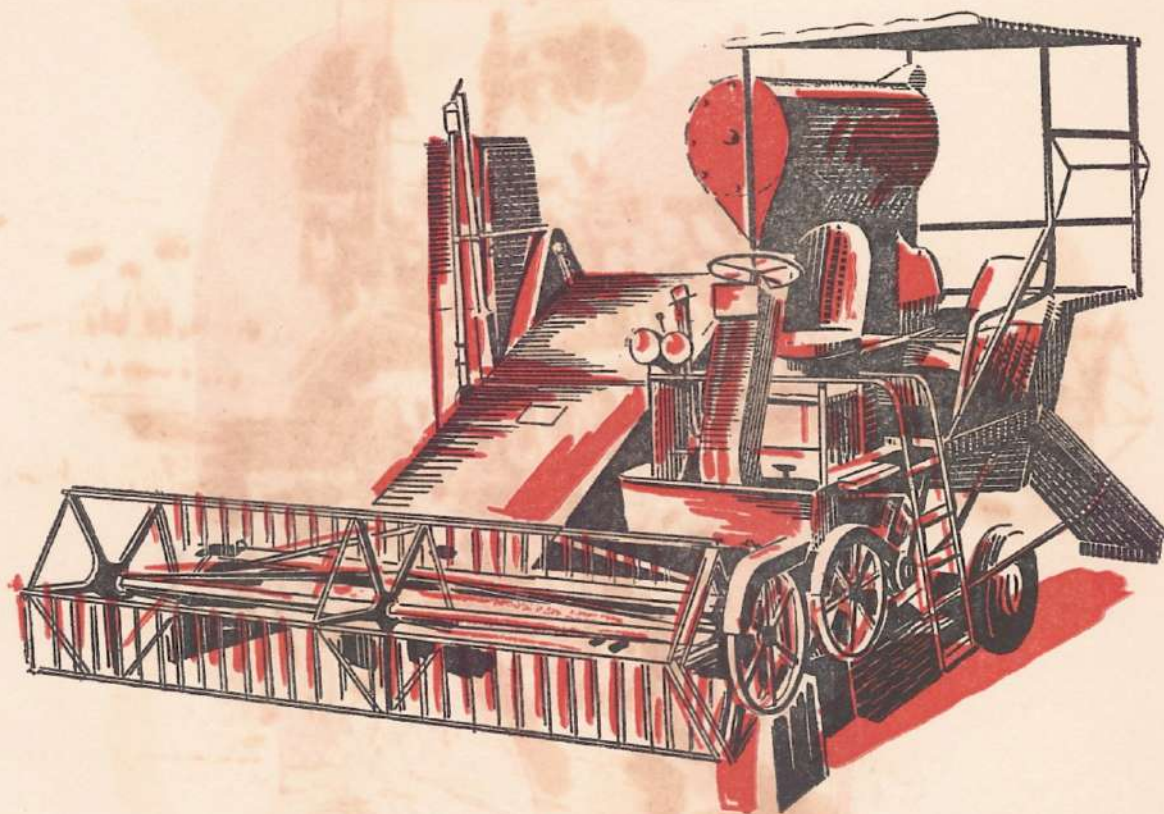
Threshing Machine



This is a modern development of the old style wooden threshing machine. Following harvest, the reaped padi is held against the revolving drum, the projections knock against the ears of the padi and thresh out the grain. It can be driven by most types of small engines.

This saves considerable expenditure of energy when compared with the threshing tub to which the planter himself has to supply the motive power to thresh the ears of the padi.

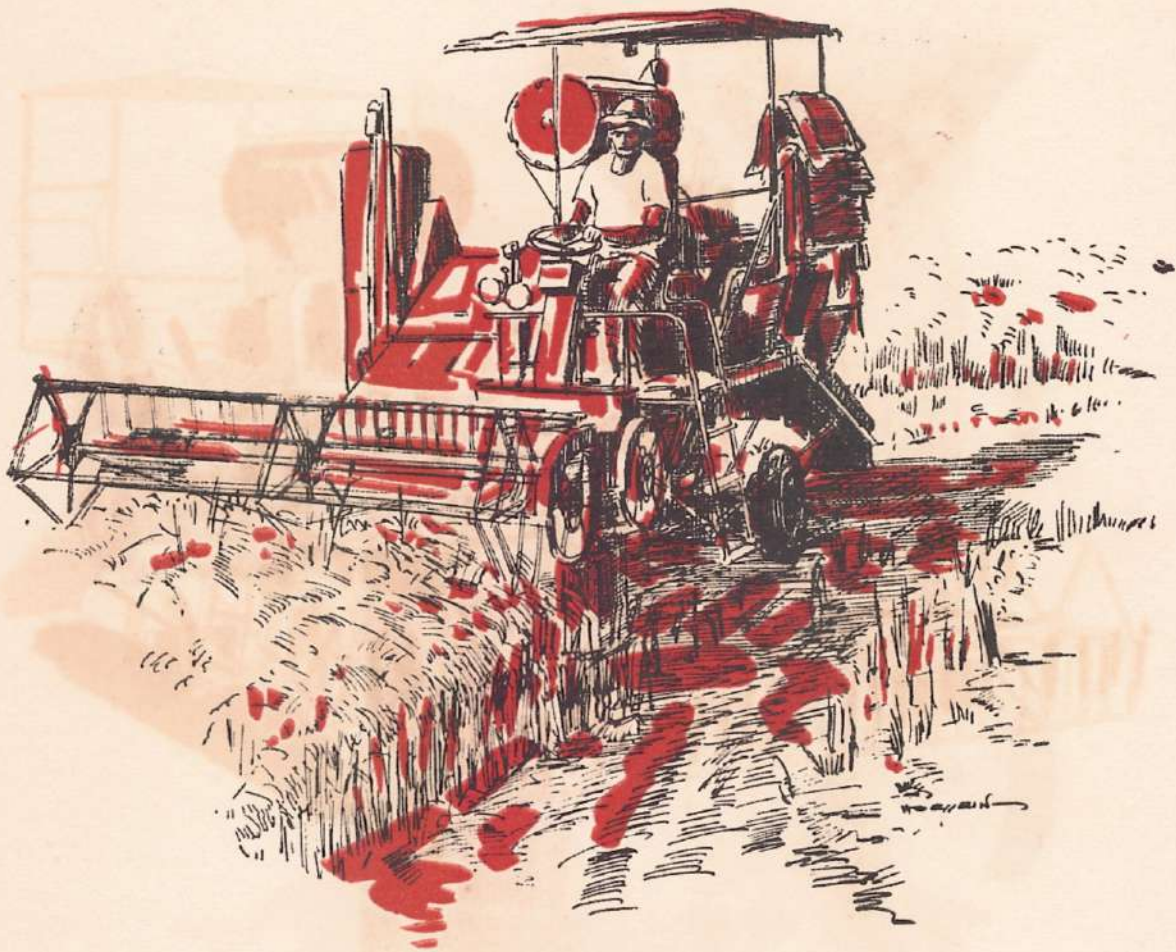
Combine Harvester



This type of machine as its name implies combines all harvesting operations. The ripened padi is cut and automatically fed into the machine where it is threshed, the straw being thrown out at the back. The padi is then bagged-off at the side.

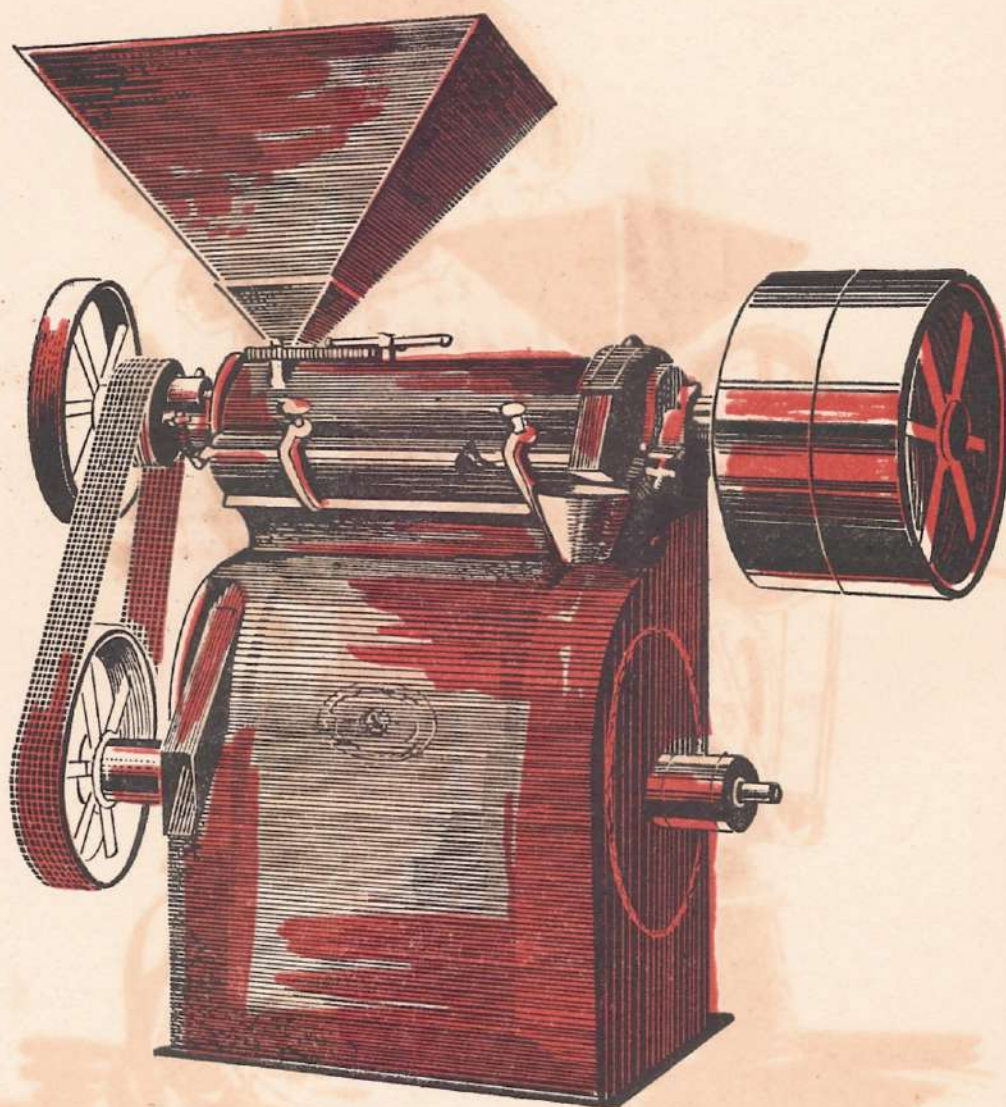
Combine harvesters are common in countries where individual farmers have large acreages of grain crops. In the Federation of Malaya one of these machines is used by the Department of Agriculture at Parit in Perak in their mechanised padi planting project.

With a standing crop a combine harvester can cut and thresh over an acre per hour.



The combine harvester—harvesting in one operation.

Rice Mill



The threshed padi is fed into the mill and during the milling process the husk and bran are removed from the rice. The milled rice is bagged for consumption, the bran for use as animal feed, and the husk is taken away and usually burnt.

This type of mill can be mounted on a trailer and then towed round the kampong areas, the mill being operated by belting from a pulley mounted on the tractor. Usual charges are \$1 per picul of padi milled, the operator retaining the bran.



Feeding the threshed padi into the mill.

